
Plasma Table Slag Removal And Slat Replacement

1.0 Maintenance Objective & Frequency

The objective of this procedure is to remove accumulated slag from the plasma table slats and replace any slats that are excessively worn, warped, or damaged. This maintenance ensures consistent cut quality, prevents torch crashes caused by uneven slats, and maintains proper material support and electrical grounding for the plasma arc.

Frequency: Perform slag removal every 40 hours of arc-on time or weekly, whichever comes first. Perform full slat replacement every 500 hours of arc-on time or when slat wear exceeds 50% of original thickness, as measured with a caliper.

2.0 Lockout/Tagout (LOTO) & Safety

- **Electrical Isolation:** Disconnect the main power disconnect for the plasma table and CNC control cabinet. Apply a personal lock and tag.
- **Pneumatic Isolation:** Close the main compressed air supply valve to the plasma table. Bleed any residual pressure from the air lines by activating the torch height control (THC) or air solenoid manually (if safe to do so).
- **Mandatory PPE:** Wear heavy-duty welding gloves, safety glasses with side shields, steel-toed boots, and a long-sleeved flame-resistant jacket. Use a respirator rated for metal fumes if slag removal generates airborne particulate.
- **Hot Surface Warning:** Allow the table and slats to cool for a minimum of 15 minutes after the last cut before beginning work.

3.0 Required Tools, Parts & Lubricants

- Replacement slats (OEM specified length and material, typically 1/4" x 2" hot-rolled steel bar stock)
- Slag hammer or chipping hammer
- Wire brush (stainless steel or carbon steel, as appropriate for slat material)
- Flat pry bar or wrecking bar
- Adjustable wrench or socket set (for slat retaining hardware, if applicable)
- Digital caliper (0-6 inch range, 0.001 inch resolution)
- Shop vacuum with HEPA filter (for fine slag dust)
- Torque wrench (if slats are bolted; typical torque 30-50 ft-lbs depending on hardware size)
- Straightedge (at least 48 inches long) or a precision level
- Penetrating oil (e.g., WD-40 or equivalent) for stubborn hardware

4.0 Step-by-Step Maintenance Procedure

1. Perform Lockout/Tagout as described in Section 2.0. Verify zero energy state by attempting to power on the CNC control and checking for air pressure on the gauge.
2. Remove any loose scrap material from the table surface. Use the shop vacuum to remove fine dust and debris from the slat area and the water tray (if applicable).

3. Inspect each slat visually for excessive slag buildup, warping, or damage. Mark any slat that shows more than 1/4 inch of slag accumulation on the top surface or any visible bowing.
4. Using the slag hammer, chip off all loose slag from the top and sides of each slat. Work from one end of the table to the other. Do not strike the slat with excessive force that could bend it.
5. After chipping, use the wire brush to remove remaining slag dust and scale from the slat surfaces. Vacuum the debris from the table.
6. Measure the thickness of each slat using the digital caliper. Measure at three points along the length (near each end and the center). Record the minimum thickness. If the slat has worn to less than 50% of its original thickness (e.g., from 0.250" to 0.125"), mark it for replacement.
7. For slats marked for replacement: Remove the retaining hardware (bolts, clips, or pins) using the appropriate wrench or socket. If hardware is seized, apply penetrating oil and wait 5 minutes before attempting removal. Use the pry bar to lift the slat out of its slot or bracket.
8. Install the new slat into the same position. Ensure it sits flat and fully engages with the support brackets. If the slat is bolted, torque the retaining bolts to the OEM specification (typically 30-50 ft-lbs). If the slat uses a clip or pin system, ensure the clip is fully seated.
9. After all slats are cleaned or replaced, place the straightedge across the slats at three locations (near each end and the center). Check for any slat that is more than 1/16 inch higher or lower than the adjacent slats. Adjust or shim as necessary to ensure a flat plane.
10. Visually verify that all slats are parallel and evenly spaced. The gap between slats should be uniform (typically 1-2 inches depending on table design). Adjust any slat that is out of alignment.
11. Vacuum the entire table surface one final time to remove any debris that could interfere with the torch height control.
12. Remove all tools and materials from the table area. Verify that no loose items remain on the table or in the water tray.

5.0 Verification & Return to Service

1. Remove all LOTO devices and restore power and compressed air to the plasma table. Follow the machine-specific startup sequence.
2. Perform a dry run (no cutting) of the torch path over the entire table area at a safe height (e.g., 1 inch above the slats). Listen for any unusual contact or scraping sounds. If contact is detected, stop immediately and re-check slat height alignment.
3. Load a scrap piece of material (e.g., 1/4 inch mild steel) and perform a test cut of a simple shape (e.g., a 4-inch square). Inspect the cut edge for dross, unevenness, or signs of poor grounding (erratic arc).
4. Measure the cut part dimensions with a caliper. The part should be within the machine's specified tolerance (typically +/- 0.010 inch for a well-maintained table).
5. If the test cut is acceptable, sign off on the PM work order in ServiceGrid. Record the date, hours of arc-on time, and any slats replaced. If issues are found, troubleshoot the torch height control, gas pressure, or grounding before returning the table to production.

Regulatory Disclaimer: This document is a generic maintenance template provided for educational and informational purposes only. It does not constitute professional engineering or reliability advice. The end-user assumes all liability for validating all step sequences, torque specs, and LOTO protocols against specific machinery OEM manuals before deployment to a live production floor.